

*ejercicio T2 (seccion 5.1, algebra lineal Kollman); demuestre que  $(u \times v)w = u(v \times w)$ .*

$$\begin{aligned}
 (u \times v)w &= u(v \times w) \\
 \left| \begin{bmatrix} u_1 & u_2 & u_3 \\ v_1 & v_2 & v_3 \\ w_1 & w_2 & w_3 \end{bmatrix} \right| &= \left| \begin{bmatrix} v_1 & v_2 & v_3 \\ w_1 & w_2 & w_3 \\ u_1 & u_2 & u_3 \end{bmatrix} \right| \left\{ (a \times b) \right\} \\
 ((u_1 v_2 w_3 + v_1 w_2 u_3 + w_1 u_2 v_3)) - ((u_3 v_2 w_1) + (v_3 w_2 u_1) + (w_3 u_2 v_1)) &= ((v_1 w_2 u_3) + (w_1 u_2 v_3) + (u_1 v_2 w_3)) - ((v_3 w_2 u_1) + (w_3 u_2 v_1) + (u_3 v_2 w_1)) \\
 ((v_1 w_2 u_3) + (w_1 u_2 v_3) + (u_1 v_2 w_3)) - ((v_3 w_2 u_1) + (w_3 u_2 v_1) + (u_3 v_2 w_1)) &= ((v_1 w_2 u_3) + (w_1 u_2 v_3) + (u_1 v_2 w_3)) - ((v_3 w_2 u_1) + (w_3 u_2 v_1) + (u_3 v_2 w_1))
 \end{aligned}$$